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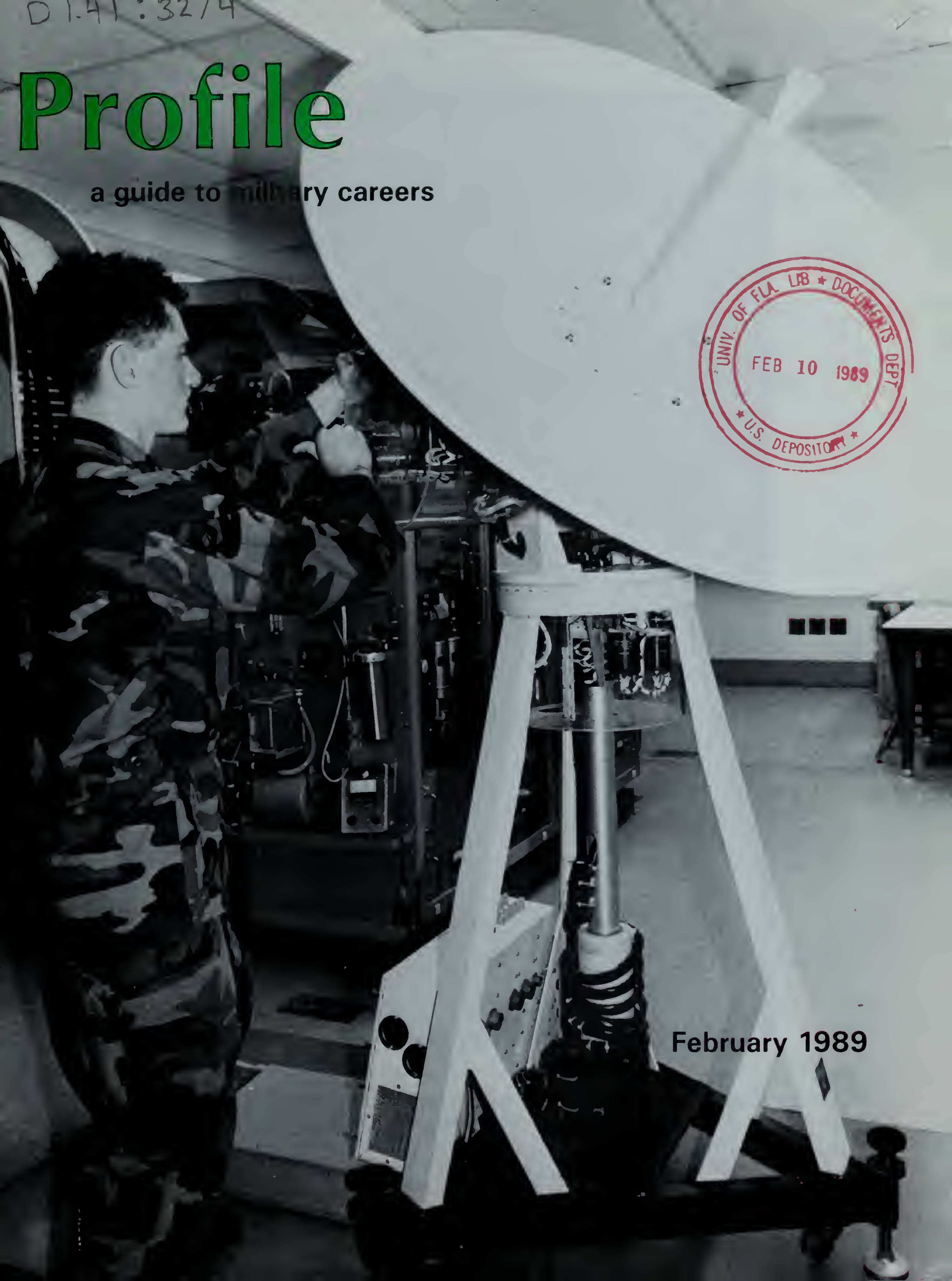
Profile

a guide to military careers



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February 1989

March's issue of PROFILE features Air Force security police dog handlers. It also focuses on Army behavioral science specialists, Navy aviation equipment support technicians, Marine Corps explosives ordnance disposal specialists and Coast Guard machinery technicians.

FLARE

Profile

a guide to military careers Vol. 32 No. 4 February 1989

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Back: Airman Chris Moreno, left, and Airman 1st Class Leon Sutton, general purpose vehicle maintenance specialists, run a diagnostic check on a truck.

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Preventive maintenance helps ensure that the systems will be ready when needed.

Satellite Communications

Story and photos
by SFC Karen Polston

The four soldiers worked fast and furiously, but their movements were controlled and efficient.

Each knew what they were expected to do. Within minutes, the satellite antenna was together, the connections were made, generators powered up and the lines of communication were open and static free.

"The antenna is like a giant high-tech 'tinker toy,'" explained Sgt. Eric Goodrich, a tactical satellite/microwave systems operator at Fort Gordon, Ga. "It's in several sections and just 'snaps' together.

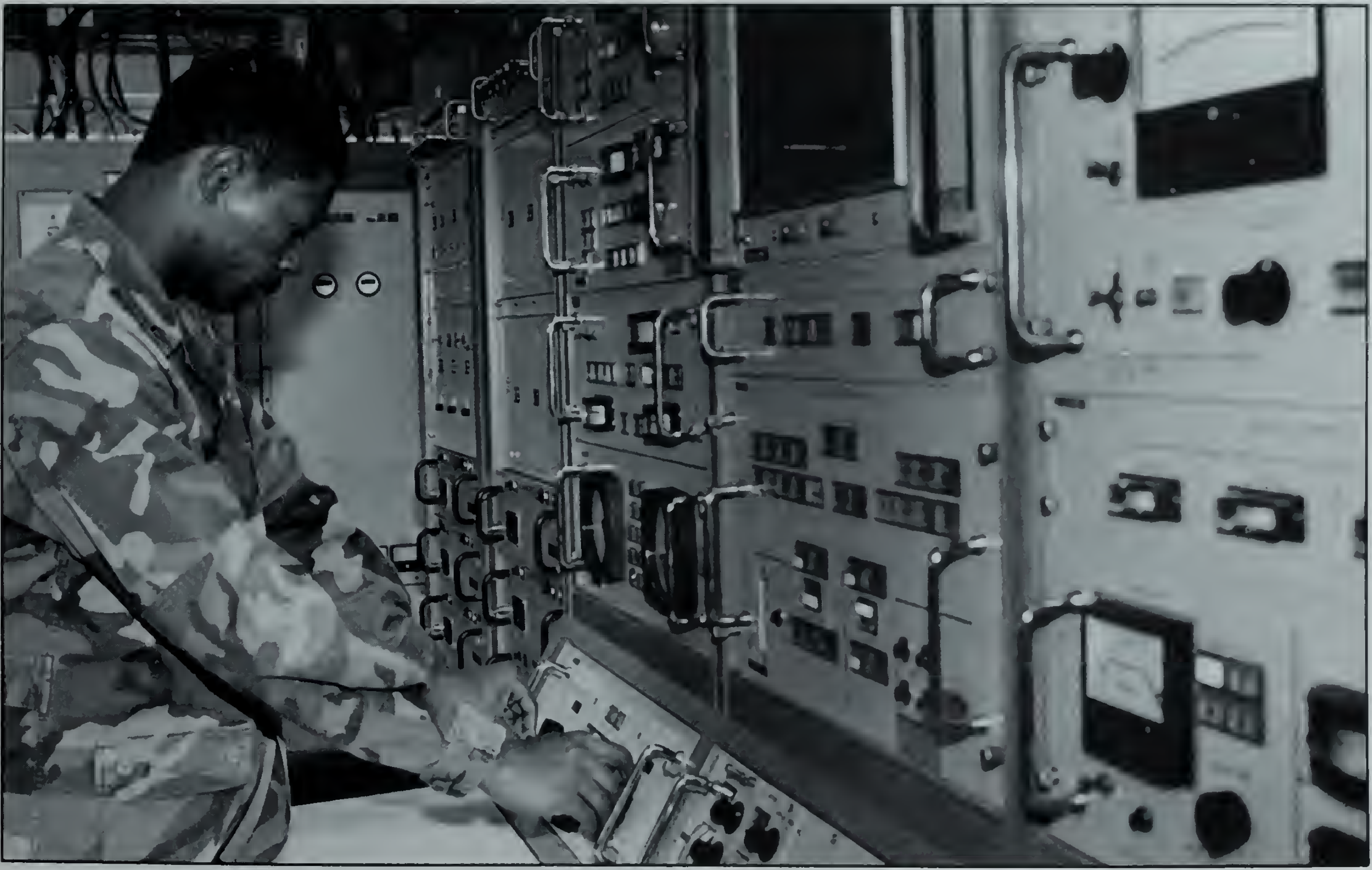
"It takes a crew of four soldiers between 15 and 17 minutes to set up the antenna, which is part of our transportable satellite terminal (the antenna, a power generator and a small van with radio transmitters and receivers).

"Basically, we 'build' the antenna and aim it toward one of the many satellites orbiting the earth. The van is then hooked up to a power generator, and with the equipment inside the portable vans, we're able to send and receive radio signals from thousands of miles away," Goodrich said.

"With these tactical satellites, we can get worldwide communication coverage, depending on the satellite we're using to send and receive transmissions.

"As tactical satellite/microwave systems operators, we deal with two other major systems in addition to the tactical satellites just described," Goodrich explained. "We also operate line-of-sight radios (field 'telephones') with a transmission distance of 50 miles and the troposcatter radio with a range of 100 miles. With this system, we scatter radio signals in the earth's troposphere for ranges beyond line of sight transmissions."

The operators are taught the trade during a



The operators must constantly fine-tune their equipment.

17-week course at Fort Gordon. The students learn basic operator skills and receive a background on troubleshooting the three major systems.

To bring all their classroom training into actual hands-on experience, the students participate in a field exercise, setting up communication lines with all three systems.

In one area, the tactical satellite terminals are set up and students in one van will make a "30,000-mile phone call" (the distance the transmission travels from the sending unit, off the orbiting satellite, back to the receiving unit) to the students in the van positioned next to it.

"The students get rather excited when they send and receive their first transmissions," Goodrich said. "Occasionally, we have to remind them to use proper radio procedures.

"The job is demanding. Tactical satellite/microwave systems operators spend quite a bit of time in a field environment when they're assigned to a unit," Goodrich stated. "We can be assigned either in the United States or overseas."

"To carry out its mission, the Army needs reliable communications. It's our job to ensure those lines of communication are open whenever and wherever they're needed. Our high-tech 'tinker toys' make it possible."

A tactical satellite/microwave systems operator replaces a circuit board.

Training involves making a "30,000-mile phone call" using tactical satellite terminals.

Power Producers

When it comes to lighting systems and electrical equipment, Coast Guard electrician's mates make sure the juice flows.

Story and photos
by J03 Amie Richardson

For years man has been developing ways of making electricity work for him. Without the ingenuity and inventiveness which have gone into this scientific evolution, electricity would be a force just as mysterious to man as the stars.

The Coast Guard operates various shipboard systems with electricity. The responsibility of keeping that equipment in top working order is that of the Coast Guard electrician's mate (EM).

"I never get bored with my work because I'm always doing something different," said Petty Officer 1st Class Glenn Lewis, an EM aboard the Coast Guard cutter Red Cedar. As the senior EM aboard his ship, Lewis supervises the operation, maintenance and repair of the ship's switchboards, generators, pumps, and meters along with various other electrically-generated machinery and appliances.

On shore, EMs repair electrical equipment such as lighthouse lamps, motors and buoys.

Electrician's mates learn their trade either through on-the-job training or at the Coast Guard Electrician's Mate School in Yorktown, Va.

The 16-week school teaches the fundamentals along with the more technical aspects of maintenance and repair of electrical equipment – from electrical safety and operation of hand tools to degaussing methods and electrical soldering.

Technological advances challenge EMs to constantly refine their skills, according to Warrant Officer Larry Jones of the Coast Guard Training Center. "Some cutters have an engineering control center that looks like something out of "Star Wars", Jones said. "The job is getting more complex all the time."

(Above) Manual dexterity and competence with tools are important qualifications for the job. (left) An electrician's mate connects wires to a buoy.

Weapons Systems

Maintenance and Control

Story and photos by PA1 Rick Woods

A Navy ship is underway somewhere in the world. Around it are many aircraft and ships of other nations. Which ships are friends and which are foes? Is that submarine ours? Where are those aircraft going? What is the overall picture?

Fire Controlmen devote 75 percent of their time to maintenance of the weather-exposed moving parts of the ship's weapon systems such as this Tomahawk Missile Launcher.

Fire Controlman 1st Class Doug Stork first has to remove the display console front panel to find a problem intentionally left for him by instructors at the Fire Controlman Tomahawk Missile technical school, Fleet Training Center, Dam Neck, Va.

The fire controlman (FC) viewing the computer-integrated picture of all known data on the Tomahawk missile control display screen knows the answers to those questions.

Chief Fire Controlman Clarence Frye explained how they know the answers. "We feed the missile's data computer the best geographical plot picture for our ship, and the position of all other ships, aircraft and submarines in the area. We identify each as friend or foe by all characteristics, such as weapons capability and other intelligence information available to us. We constantly update files on each contact." Frye is an instructor at the Navy Fire Controlman (FC) school for the Tomahawk missile system at Fleet Training Center, Dam Neck, Va.

Frye explained that a new FC will spend almost a year in school learning the nuts and bolts, wires and transistors, logic and layout of an entire fire control system.

That training starts at FC "A" School, Great Lakes Naval Base, Chicago. Students there complete four to nine weeks of individualized basic electricity and electronics training before starting the first of two 11-week phases of Class 'A' technical school.

Specialized schools such as the 16-week course at Dam Neck for maintenance and operation of the Tomahawk missile system follow after 'A' school.

Teams of FCs maintain the control mechanisms used on weapons systems on fighting ships and submarines. Complex electronic, electrical, hydraulic and mechanical equipment is required to ensure the accuracy of Navy guided missiles, gunfire and underwater weapons. FCs are responsible for the operation, routine care and repair of this equipment, which includes radars, computers, weapons direction equipment, target designation systems, gyrocompasses and range finders.

Their job also includes processing data from the missile's computer and display screen 24 hours a day. Because of a ship's evasive tactics, it may or may not be where it is indicated on the screen, Frye said.

As they gather their data, fire controlmen assign "factors of uncertainty" to allow for this, Frye said. They then combine all this information and report it to the Combat Information Center, where it is combined with data from the bridge and other departments of the ship. People in the CIC plan tactical strategies based on this information.

The FC uses this information to plan "engagements" for anti-ship, -submarine and -air warfare readiness and, with the Tomahawk missile system's terrain-matching capability, land targets. FCs can program the Tomahawk missile to avoid one target to reach another, and even go out and search for a target in a specific area.

"When I first saw this system, I was really impressed," Frye said. "You can't get any better than this! This is great! The operator sits down and he knows where he is in the world. The fire controlman knows exactly what's out there." ⬠

Fire Controlman 1st Class Doug Stork (rear), a student at the Tomahawk Missile System technical school, Fleet Training Center, Dam Neck, Va., is looking for a problem in the system intentionally created for him to find by Fire Controlman 1st Class Mike Hartsell, Tomahawk missile system instructor.

Fire power plus

Rocket Launchers

Story and photos by SSgt. Linda Mitchell

The Army's all-terrain Armored Vehicle-Mounted Rocket Launcher (AVMRL) looks like a cross between a tank and a dump truck on tracks instead of wheels. The vehicle's windows have metal louvered shutters, which are shut and locked from the driver's control panel during live fire exercises to secure the crew inside. The cab also contains a fire control panel, and the launcher on the rear of the vehicle raises much the same as the bed of a dump truck.

This, however, is where the similarity to a tank or dump truck ends.

The raised launcher holds two container pods. Each pod weighs about 5,000 lbs., and contains six rockets. A live warhead on each rocket contains 644 M77 munitions bomblets. An AVMR launcher can deliver 7,728 of these munitions in less than one minute to ranges in excess of 25 miles, and the rockets can be fired individually or in ripples of two to 12. The rockets leave the pods at speeds exceeding the speed of sound. Immediately after leaving the pod, the rocket peels away, launching the bomblets over the area.

As Paling describes his job, a ball of fire arches across the firing range and a roar shatters the silence.

"I am a multi-launch rocket system (MLRS) crewmember on the AVMRL, also known as a Self-Propelled Rocket Launcher," said Private 1st Class Timothy Paling, who is assigned to the 4th Infantry Division (Mechanized), at Fort Carson, Colo. As Paling describes his job, a ball of fire arches across the firing range and a roar shatters the silence. Another rocket has just been launched during a field exercise.

MLRS operators are trained to fill several positions, including the launcher crew, the fire control center crew, the headquarters ammunition crew and the ammunition load crew.

"Each AVMRL has a three-man crew," Paling said. "Aside from driving, the driver secures the cab during live fires. The gunner operates the fire control panel, which is a small computer linked digitally with the fire control center; and the section chief is in charge of the crew." When they're not involved in exercises, the launch crewmen perform minor preventive maintenance on the vehicle, checking the fluid levels and making sure the tracks and other road gear are working properly.

The fire control center goes out to the field with the AVMRL, where it is manned by MLRS crews who establish the area to which the launcher must go. Upon arrival at the launch site, the FCC crew inputs direction and range coordinates to the computer, which automatically calculates and sets the launcher's elevation and the direction in which it should be aimed. It also sets the fuse time for the warheads. This information appears on a screen on the cab's fire control panel, the gunner pushes the fire button, and the computer makes the necessary aiming adjustments between firings.

Fully loaded, the launcher can travel at speeds reaching 80 miles an hour under favorable conditions.

"The launcher has some interesting features, such as the system which tells us where we are, where we need to be and the direction we're facing," Paling said. "Additionally, when fully loaded the launcher can travel at speeds reaching 80 miles an hour under favorable conditions."

Delivering ammunition to the launch site is detailed to multi-launch rocket system operators on the ammunition headquarters and ammunition load crews.

"Headquarters is a command post located behind the firing lines, from which crews direct ammunition deliveries," explained Private Joe Lahmann at Fort Carson. "Crewmembers assigned to headquarters ammo operate the radio network for the ammunition crews and the remainder of the battery. They make sure the ammo truck crews deliver the new pods to the correct coordinates, and that the launch crews know where to pick them up.

"Ammo truck crews must deliver the rockets as quickly as possible from the ammo point to the launchers so they can load them up and complete their missions," said Spec. Rock Wood, also at Fort Carson.

"We do a lot of driving in this job," he added, "particularly at night with virtually no lights. Of course, there's nothing out here on the firing range for miles, and driving here with no lights is good practice in case we ever have to experience driving during blackouts in a war zone."

Multi-launch rocket system crewmembers learn their job during nine weeks of training at Fort Sill, Okla. They learn to operate the launcher, the fire control panel and the computer. Classes in radio operations and vehicle maintenance are also taught.

"This job requires a general test score of 100, which is very high on the Armed Forces Vocational Aptitude Battery," Wood said. "Because this is a primarily computer-oriented military occupational specialty, we become heavily involved in electronics. In school, students also learn how to calibrate the computer, because if it's not functioning properly, the launcher's coordinates will be off."

After the AVMRL on which Paling is a crewmember completes its firing sequence, it moves rapidly to another location. Soon, another ball of fire will arch across the field and another roar will shatter the morning's silence. The AVMRL and its multi-launch rocket system crewmembers will be at work once again. ⬠

(Above) The fire control panel inside the AVMRL is monitored by the gunner. (Below) An Armored Vehicle-Mounted Rocket Launcher maneuvers into position.

(Above left) Airman 1st Class Leon Sutton (left) and Airman Chris Moreno go over the technical order instructions explaining how to run a diagnostic check on a vehicle. (Above) Airman 1st Class Troy Cook shows Airman Moreno how to fix an aircraft tow vehicle. (Above right) Airman Cook works on a snow plow. (Below left) Airman Sutton checks the oil on a truck.

Air Force

Auto Mechanics

**Story and photos by
SSgt. Linda Mitchell**

Given its name, it can be assumed that the Air Force would have trouble existing without its airplanes and the people who fly and fix them.

The base's operations won't come to a full stop if a few planes can't fly for mechanical reasons. If, however, the problem is a broken-down snow plow or a run-down aircraft maintenance vehicle, general purpose (GP) and special purpose (SP) vehicle maintenance men and women become indispensable.

Special purpose vehicles include large equipment like bulldozers, aircraft towing trucks, flightline and road sweepers and snow removal equipment. General purpose vehicles include pickups, vans, staff cars and buses.

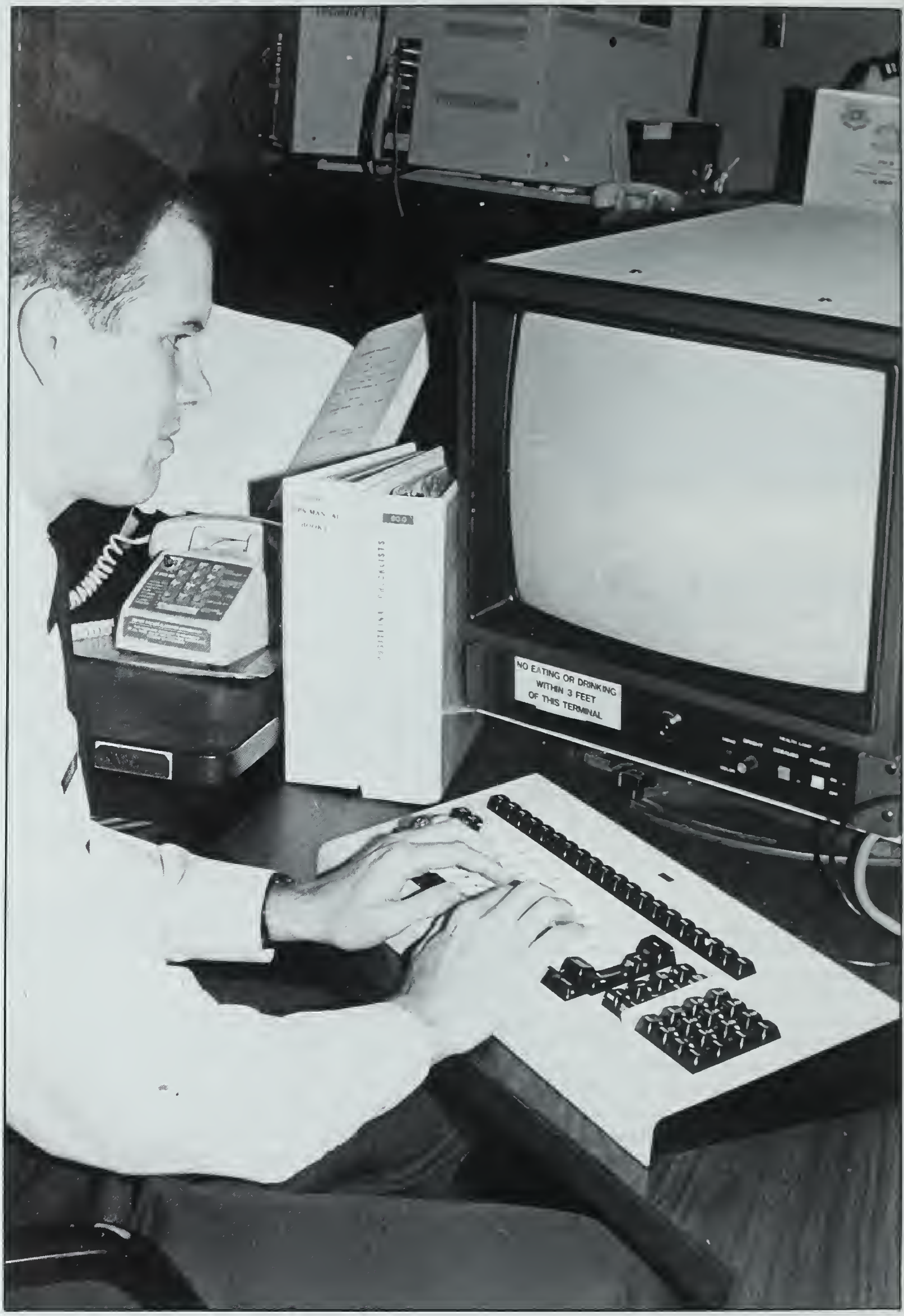
The type and size of the vehicle may differ, but the mechanics perform similar jobs.

"We do in-vehicle repairs on transmissions and engines, rear differentials and axles," said Airman Chris Moreno, a GP vehicle maintenance specialist in the 1st Transportation Squadron, Langley Air Force Base, Va. "We repair or replace electronic or computer ignition systems; balance tires and perform wheel alignments; and run diagnostic checks on batteries and engine components. Additionally, we replace or patch tube tires and retread tires after the original treads have worn down."

"General purpose mechanic trainees spend 10 weeks at Chanute Air Force Base, Ill," said Airman 1st Class Leon Sutton, a GP mechanic at Langley. "In six training blocks, students advance from learning basic engines to practicing on diesel engines. In other blocks they learn the braking, steering, electronic and electrical, and other systems in various vehicles."

"Special purpose vehicle maintenance specialists acquire their skills through on-the-job training," said Airman 1st Class Troy Cook, an SP mechanic at Langley. "When I arrived here, I entered the squadron's supervised training program. When there's no one around to answer a question, however, the squadron has a training library including step-by-step video and technical order instructions on how to fix any vehicle repair problems that come up. Even when I don't have a problem, I spend time learning about systems I haven't had experience on yet.

"The work is definitely more complicated than what students find in their school's auto mech shop," Cook said, adding that "the only requisite for this job is that they have a desire to dig into a difficult, dirty mechanical problem and try to fix it." ⬠



Second Lt. Austin Jameson prepares to monitor satellite equipment.

Satellite Operations

Story and photo by
SSgt. Linda Mitchell

"The Air Force has made giant advances in space and satellite-related career fields in the last few years," said 2nd Lt. Austin Jameson, "and the Satellite Operations Officer career field is one of the best to be in to make these advances along with the Air Force."

Jameson is a satellite operations officer on a space systems operations crew assigned to the 2nd Satellite Control Squadron, 2nd Space Wing, Falcon Air Force Base, Colo.

Each space systems operations crew is made up of seven members: the crew commander, the deputy crew commander, two satellite operations officers, one ground system operator (enlisted), a satellite analyst officer and a satellite engineering officer.

Their areas of expertise deal with either directly operating/commanding a satellite or analyzing orbits and keeping track of the objects in space. Jameson's job falls under the heading of operating/commanding a satellite.

"As a satellite operations officer, I operate and control the satellites that have been launched, including monitoring the satellites to make sure they're working properly and that all systems are up and going. If something is wrong, I determine the type or class of malfunction and correct it.

"Monitoring navigation satellites is a specific function of this squadron," Jameson said. "Navigation satellites transmit specific navigational signals to what we call the user community–that is bases and aircraft that have a need for this information. Every six hours I transmit a message, called a navigational upload, to the satellite to update the information it's sending to the user community."

To enter this career field, college graduates must hold a degree in mathematics, physics, astronautics, astronomy, computer science or industrial technology. After being commissioned either through the Air Force Academy, an Air Force Reserve Officers' Training Corps program, or through Officer Training School, future satellite operations officers attend five months of undergraduate space training at Lowry Air Force Base, Colo. They learn the basics of all the satellite systems, including orbital mechanics and general information about the satellites such as how they're launched; how to maintain their orbit; and how they operate.

Satellite operations officers then receive system-specific training during nearly four weeks at the 1013th Combat Crew Training Squadron, Peterson Air Force Base, Colo. This includes learning the main-frame computers and ground equipment, as well as more about the specific satellite system they'll be assigned to.

"This field offers a great opportunity to break into space-related fields," Jameson said. "Because it's still so new, there are lots of opportunities to advance and learn about new space and satellite systems constantly being introduced into the inventory."

Fuels Specialists

Story and photos by
SSgt. Linda Mitchell

When your personal truck or automobile is almost out of gas, you drive into the nearest gas station and say "Fill 'er up!"

But what do you do if your "vehicle" is an airplane or a tank? Pulling up to a filling station pump is out of the question.

The Air Force, Army, Navy and Marine Corps solve this problem by bringing the fuel to the user.

"We receive fuel from a commercial barge or other transport, and pump it into bulk storage tanks," said Air Force Staff Sgt. Jose Toro, a fuels specialist in the 436th Supply Squadron, Dover Air Force Base, Del. "From there, fuel trucks deliver the fuel to pump houses beneath the flightline, the aircraft pulls up to the pump and fuel is loaded on board."

The Navy has a similar system, according to Aviation Boatswain's Mate/Fuels 1st Class Ken Kimball, stationed aboard the aircraft carrier USS John F. Kennedy, Norfolk Naval Base, Va. "We have storage tanks in the hangar bay under the flight deck and pumps both below and on the flight deck which pump the fuel through hoses to the aircraft."

Aviation Boatswain's Mate/Fuels 1st Class Ken Kimball, checks a fuel pump on the flight deck of the USS John F. Kennedy.

An Air Force fuels laboratory technician runs a test on a fuel sample.

Because most of their work is done in the field on exercises, the Marines and Army transport the fuel from bulk storage to the field in truck-mounted tanks or 20,000-gallon bags.

There's a lot more to the job than being a gas station attendant to airplanes and tanks, however.

"Whether it's an airplane or a pickup truck," Toro explained, "it's an important, expensive piece of equipment and must receive the best, cleanest fuel or oil product we can produce. Even before accepting the fuel, we start running tests on it."

The initial test begins about 15 minutes after the fuel begins pumping into the above- or below-ground bulk storage tanks. This lab test checks for sediment and excess water in the fuel. It also ensures that levels of fuel additives are what they should be. "We make sure that the level of the fuel systems icing inhibitor (FSII) in JP4 and JP5 fuel is correct," said Staff Sgt. Tomy Campbell, a fuels laboratory technician at Dover AFB. "The FSII prevents the small amount of water in the fuel from freezing at high altitudes. Additionally, because fuel is explosive, we check its conductivity additive, which prevents static electricity."

After the initial lab test, similar tests are run every six hours on the fuel in the storage tanks. Lab tests and a multitude of equipment checks are also performed at various stages of the process of transferring the fuel from bulk storage to the using vehicle. These tests and checks include making sure filters, pumps, pipelines, trucks and other storage tanks remain clean and operating efficiently. When fuel is transferred from one point it is tested again.

"Additionally, we have to keep track of the amount of fuel we have on hand," said Army Spec. Richardo Obie, a petroleum supply specialist in the 549th Quartermaster Co., Fort Story, Va. " The fuel level and volume constantly change in different temperatures, so every few hours we must accurately measure the amount of fuel we have in the tanks."

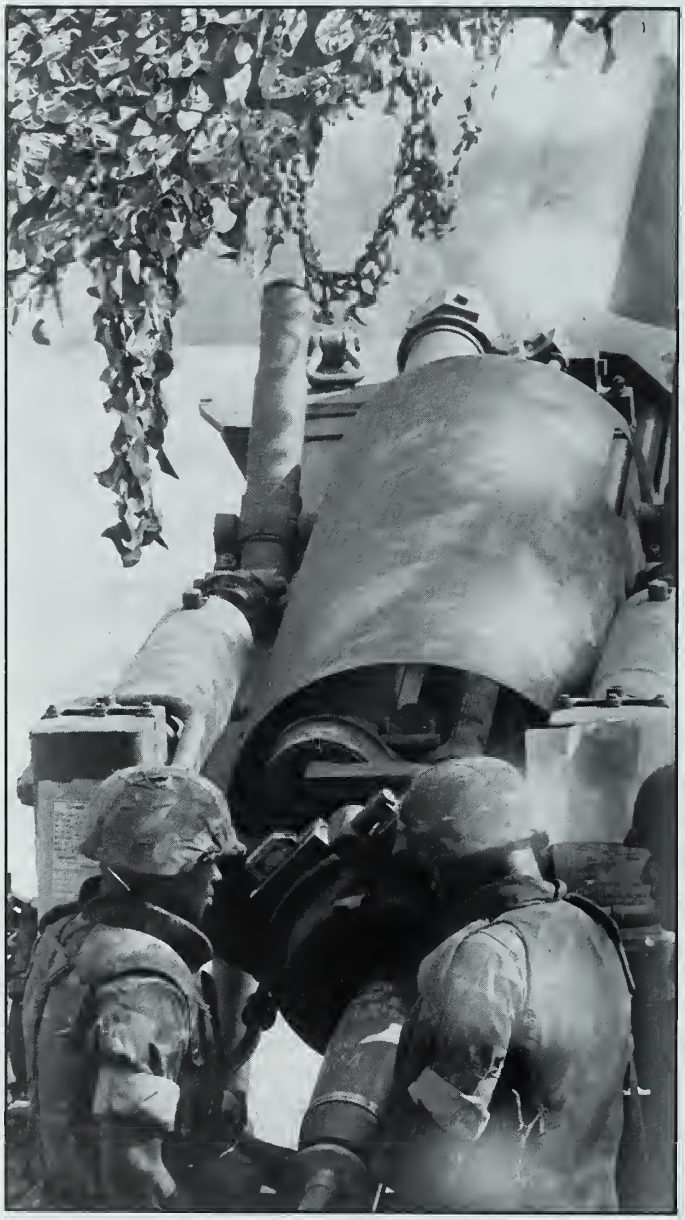
The schools and course lengths vary according to the different services. Air Force students attend a six-week-long course at Chanute Air Force Base, Ill. The Navy has "A" and "C" schools at Naval Air Station Lakehurst, N.J. "A" school is eight weeks long and the advanced "C" school is six weeks. Army petroleum supply specialists and Marine Corps bulk fuelmen learn their trade at a nine-week course at Fort Lee, Va.

"Army petroleum supply specialists also receive in-unit training in fuel fire fighting," Obie said. "Since we can't bring fire trucks and fire fighters to the field with us, petroleum supply specialists must learn which chemicals or water will effectively fight a fuel fire, depending on what kind of fuel it is."

Although they can't bring the fire trucks and fire fighters to the field, fuels specialists bring something that's just as important to the exercise–the transportable "filling stations" and fuel to keep the vehicles moving.

They're good enough to fight on the front lines, but field artillerymen are at their best when they use their. . .

Long distance firepower



Members of the firing team await the command to load and fire.

Story and photos
By Spec. Paul White

Infantrymen are nicknamed "grunts" in the Marine Corps, but since all Marines must master basic combat skills, one could say there's a little "grunt" in every Marine.

There's a lot of "grunt" in field artillerymen.

"Essentially, we're infantrymen with bigger guns," said Lance Cpl. Jeff A. Killian, a field artillery section chief in the 1st Battalion, 10th Marine Regiment at Marine Corps Base Camp Lejeune, N.C. "We have to know both jobs. If our guns go down, we become grunts."

Artillerymen like Killian spend a lot of time keeping their "bigger guns" working properly. After all, the infantryman's M-16A2 rifle is nice, but wiping out enemy targets from several miles away calls for industrial-strength firepower.

In Killian's unit, the weapon of choice is the 105mm howitzer, which has a maximum range of more than six miles. Other artillery weapons include 155 and 175mm howitzers and heavy mortars. "Without our support, it's tough for the infantry to move forward," said Sgt. Harold D. Evan, a field artillery operations chief.

Teamwork is essential in field artillery. Each round that lands successfully means many Marines with a variety of skills have done their jobs. An advance team first selects an operating site which "offers concealment and from where we can best accomplish our mission," said 1st Sgt. Mike R. Eggleston. "Once that's established, we can set up and be ready to fire in 10 minutes."

Miles from the rest of the artillerymen, forward scout observers work with the infantry to determine where and when fire support is necessary. Mistakes by the observers, Eggleston noted, can be tragic. "If they miscalculate their position, they can wind up calling fire on themselves," he said.

Calls for fire are relayed to the artillery's fire direction control team. Using maps and mathematical formulas, the FDC team determines how the cannons should be adjusted to hit the targets. "We're the

Lance Cpl. J.C. Riggs makes prelaunch adjustments.

Lance Cpl. Michael D. Cox and Pvt. Steve Crawford prepare to load a 95-pound shell.

brains of the unit," Evan said proudly. "The guns can't shoot until we provide the data. Everything revolves around us."

The FDC information is forwarded to the gun teams, normally consisting of 10 men. These teams adjust, load and fire the howitzers. A section chief oversees their efforts. "I've held each job in the gun team before," Killian said, "and that's important because I've got to know everyone's responsibilities."

Artillerymen learn their basic cannoneer skills during a six-week course at Fort Sill, Okla. (Advancement to section chief, fire direction control and operations chief requires additional schooling.) "Much of an artilleryman's training comes when he reaches his first assignment," Eggleston said.

Much of the time, home to an artilleryman is a two-man tent pitched in the great outdoors. "We spend about one-third of the year in the field," Eggleston said. "We'll be out anywhere from three days to a month and a half."

The men and weapons are transported to operating sites in five-ton trucks. "That's one thing we have on the infantry," said Pvt. Gary C. Howard. "They march everywhere. We ride."

"Yeah," Killian noted, "but don't forget about that 25-mile march we had a couple of weeks ago. We do plenty of infantry training around here, too."

"It takes a strong-minded individual to work in this field," said Howard, who helps load the 95-pound rounds into the howitzers. Reflecting on a recent 40-day field excursion, he added, "You've really got to love what you're doing." ⬠

Lance Cpl. Michael D. Cox keeps on the lookout for air assaults.

Purple Mountain Majesties

Story by
SSgt. Linda Mitchell

"O beautiful for spacious skies,
For amber waves of grain,
For purple mountain majesties
Above the fruited plain!
America! America!
God shed his grace on thee
And crown thy good with brotherhood
From sea to shining sea!"

The words to America the Beautiful were written in 1893 by Katherine Lee Bates, after she climbed to the top of 14,110-foot Pikes Peak in the Rocky Mountains towering over Colorado Springs, Colo.

Pikes Peak was named for Zebulon Pike, who, in 1806, was the first man to document its existence. At that time, he reportedly predicted that no man would ever ascend the mountain, but since then many men and women have proven him wrong.

In 1901, the first automobile climb up Pikes Peak took two Denver men nine hours, but that time has been shortened by entrants in the annual Pikes Peak Auto Hillclimb, first raced in 1915. The second oldest car race in America behind the Indianapolis 500, the Hillclimb is a 12.5-mile course containing 156 hairpin turns.

For those who choose a more relaxing way to get to the top of Pikes Peak, a cog railway makes the trip in about three hours.

When General William Jackson Palmer founded Colorado Springs in 1871, he had visions of making it into a resort area. Although his dream of amusement parks and other man-made attractions never came about, the area's natural attractions have made

Pikes Peak provides a dramatic backdrop for the Garden of the Gods. Located in the foothills of the Rockies, Garden of the Gods features naturally-formed rocks which are a rock climber's dream come true. (Photo courtesy of the Colorado Springs Convention and Visitors Bureau) tourism a booming industry.

Pikes Peak is the most famous, but not the only attraction drawing millions of visitors to Colorado Springs each year. People travel from all over the world to see the area's other natural wonders, including Garden of the Gods, a garden of natural rock formations which are perfect for the avid rock climber; Seven Falls; Royal Gorge; Cheyenne Mountain; Cripple Creek and Cave of the Winds. The world's highest suspension bridge spans the Royal Gorge, and visitors can view the gorge by either crossing the bridge or by riding horseback to the bottom of the gorge.

Colorado Springs offers everything from every kind of winter sport imaginable to mountain climbing, western ranch resorts, white water rafting and rodeos. Additionally, the city has hosted three U.S. Olympic Sports Festivals since 1978, and the Olympic Training Center provides training camps, coaching seminars, clinics, board meetings and competitions yearly to thousands of national and international athletes and coaches.

Old mining towns still abound in the Colorado Springs area, and visitors can take a hand at panning or mining for gold or silver, or they can watch authentic, classic melodramas in theaters in nearby Cripple Creek and Iron Springs.

Manitou Cliff Dwellings Museum, about five miles west of Colorado Springs, provides a look at the lives of cliff dwelling Taos Pueblo Indians. Many local galleries, trading posts and museums in the area sell or display jewelry, sand paintings, rugs, arts and crafts made by Hopi, Zuni and Pueblo Indians.

Although old West pioneers and Indians first settled Colorado Springs, the city has more recently been inhabited by thousands of military personnel representing the Army, Navy, Air Force and Marine Corps. They are assigned to the 4th Infantry Division (Mechanized), Fort Carson, and North American Aerospace Defense Command's Cheyenne Mountain Complex. Others work in U.S. Space Command, Air Force Space Command and 1st Space Wing, Peterson Air Force Base, and 2nd Space Wing, Falcon Air Force Base. The military community also includes Air Force officers and enlisted personnel assigned to the administrative and instructor staffs of the Air Force Academy and approximately 4,400 Academy cadets.

General Palmer may have been right in finally realizing that a resort city based on man-made attractions wouldn't draw many visitors, but he was wrong in underestimating the lure of Colorado Springs' natural beauty. To millions of visitors and inhabitants, Pikes Peak's "purple mountain majesties" make Colorado Springs a fun and beautiful place to be. ⬠

The U.S. Olympic Complex, training center for national and international athletes and coaches, is overshadowed by Pikes Peak and the Rocky Mountains. (Photo by Ron Ruhoff)

Space Observers

Story and photo by SSgt. Linda Mitchell

Air Force Master Sgt. Nadine Pohlson finds it difficult to summarize her job in a short time.

"Do you have a couple of hours?" she asked, half-joking and half-serious.

Pohlson is an aerospace defense and warning systems technician. She is also the noncommissioned officer in charge of the Space Surveillance Section in North American Aerospace Defense (NORAD) Command's Cheyenne Mountain Complex near Colorado Springs, Colo. NORAD provides surveillance and control of the airspace of Canada and the United States, combining defensive and offensive air forces from both countries.

"Basically," she said, "we have radar sensors and antennas located at long-range radar (LRR) sites worldwide. They transmit radar signals to the launched objects, which answer by transmitting signals back to the sensors. The sensors then feed these received signals through a computerized system and data lines to computers here.

"Air Force, Navy and Army orbital analysts have programmed computers to accept, analyze and translate each signal into a visual display and other information which tells them exactly what was launched–airplane, missile, rocket, satellite or shuttle–its size, type and country of origin.

"**This** information is then transmitted within minutes of the launch to one of our centers, depending on what the object is, for further identification and monitoring. The centers include Air Defense Operations (aircraft), Missile Warning and Space Defense Operations (missiles) and Space Surveillance (satellites and other space craft). Aerospace defense and warning systems (ADWS) operators monitor these objects from the time of launch until they come back to earth, and constantly keep the NORAD Command Post informed."

If the launch is an aircraft, the Air Defense Operations Center takes over. An ADWS operator monitors a radar scope, detecting and tracking the blip (track) indicating the location of the aircraft. Using the LRRs, operators in the height section can take an altitude reading on the aircraft to possibly identify the aircraft by its altitude. For example, fighter aircraft can normally fly at higher altitudes than bombers or even commercial airliners can.

If the aircraft remains unidentified, Air Defense's weapons section operators initiate identification procedures, beginning with getting two interceptor aircraft airborne and directing them to the location of the unidentified aircraft. Depending on whether the aircraft is friend or foe, the interceptors then follow set procedures to contact and escort the aircraft out of the area.

Missile Warning and Space Defense Operations ADWS operators go into action when a missile launch takes place. "This can be a very stressful job," Pohlson said. "The operators must be constantly aware of all scheduled and unscheduled domestic and foreign missile test launches. They must quickly identify all launches–the type of missile, place of origin and where it's expected to impact–and alert military officials in the NORAD Command Post that the launch has taken place so they can take immediate appropriate action."

ADWS operators in the Space Surveillance Center detect, track, identify, catalogue and maintain the status of foreign and domestic man-made objects in space. The catalogue, containing more than 5,400 objects, provides a blueprint of what is going on in space. "Using computer programs, orbital analysts can determine the size and origin of any object in space, including communications and reconnaissance satellites, the space shuttle or other objects," Pohlson said. "We can also determine each satellite's precise orbit."

Satellites can be monitored for months or years, so there may be times in the Space Surveillance Center when things seem relatively quiet. However, "our center goes berserk from the minute the space shuttle launches until it lands back on earth," Pohlson said.

As with the shuttle, Newton's theory that what goes up must

Master Sgt. Nadine Pohlson monitors a radar screen in the Space Surveillance Center.

come down eventually applies to all dead or decaying space objects. By monitoring all space object activity, ADWS operators can predict, confirm and report any space object that could survive re-entry into the earth's atmosphere. "Most of the space 'junk' burns up on reentry," she explained, "but pieces have been known to survive, and we monitor them until they hit earth. We have to know where they are and where they might land so we can warn everyone in the area where it might impact."

The seven-week ADWS school is at Keesler Air Force Base, Miss. Students learn the basics of the computer and radar equipment they will work with when assigned to the radar sites or to a center. They learn how the sensors work, what information they're processing and who the information is going to.

"Very basically, that's my job," she said. "Even so, it changes and expands constantly, with new airplanes, missiles, satellites and shuttles being launched almost daily. That's why I ask, 'Do you have a couple of hours?' whenever someone asks me about my job." ⬠

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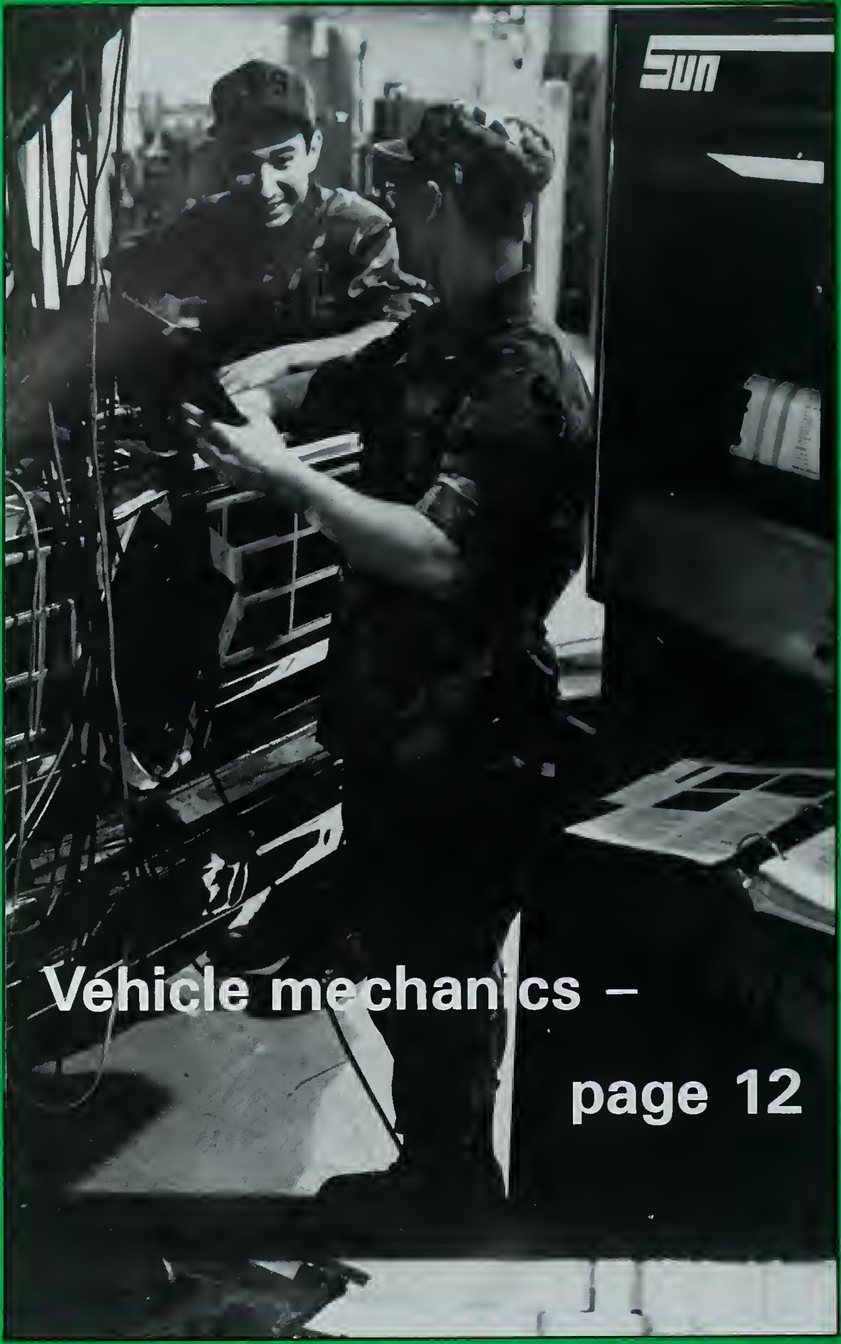

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The real key to success is within yourself. No one can give it to you or take it from you. You hold your destiny in your hands.

Ronald Reagan

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